



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,520	10/15/2003	James Crawford	TDSN.P0001	5246
48947	7590	12/21/2005	EXAMINER	
STATTLER, JOHANSEN, AND ADELI LLP 1875 CENTURY PARK EAST SUITE 1360 CENTURY CITY, CA 90067			EVANS, FANNIE L	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 12/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/687,520

Applicant(s)

CRAWFORD ET AL.

Examiner

Sarah J. Chisdes

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 17, 37 and 38 is/are allowed.
6) ☒ Claim(s) 1-15 and 18-35 is/are rejected.
7) ☒ Claim(s) 16 and 36 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 15 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Amendment

The amendment to the claims submitted on October 28, 2005 have been received and entered of record into the file.

Claim Objections

As a result of amendment, the objection to claim 6 is withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8, 10, 23-27, 29 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Byers (US 4,553,034), previously cited, in view of Alfano et al. (US 6,255,118).

In figure 2, Byers discloses a fluorometer having a distal end (30), a light source (22), and a light detection circuit (36, 38, 40, 42) , as specified in claim 1, as well as two orifices optically coupled to the light source and detector by fiber optic cables (26, 32), as specified in claims 2, 3, 4, 7, 8, and 10, where the claimed orifices are understood to be an inherent property of the components of the disclosed distal end, or no light could get through and the device would

Art Unit: 2877

not work, and the fiber optic cables are understood to be light-passing conduits. Also disclosed in Figure 2 are emission and excitation filters (24, 34), as specified in claim 5, and a flange (28) that acts in the same manner as the chassis to align the optical system, as specified in claim 6.

Byers fails to disclose that the light source is a light emitting diode (LED). In column 1 lines 26-28, Alfano teaches, "It is generally known to use diode lasers or light emitting diodes (LED) as solid-state excitation sources for fluorescence", and continues in lines 29-31, "As early as 1988, a fluorometer from an LED and a photodiode detector was constructed." It would have been obvious to one of ordinary skill in the art at the time of invention to use a light emitting diode as the light source in the device of Byers in order to make the device smaller and lighter, as well as to use a more stable light source that requires less power.

Claims 23-27 and 29 comprise the same elements of claims 1-8, and 10, but are claimed as part of a spectrometer, rather than an fluorometer. A fluorometer is a type of spectrometer, therefore the elements that meet the claim of a fluorometer also meet the claim of the more general spectrometer. Hence, the limitations of claims 23-27 and 29 are met by Byers in view of Alfano according to the rationale set forth above.

Claim 32 limits the elements of claim 23 to being part of a fluorometer. Those elements have been disclosed by the combination of Byers and Alfano as part of a fluorometer, as set forth above, hence all the limitations of the claim have been met.

Claims 18 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Watts (US 5,013,150), previously cited, in view of Alfano.

In Figure 1, Watts discloses a fluorometer with a dual optical fiber probe which has two orifices on the side that is to be placed next to the analyte. The fluorometer is provided with a light

Art Unit: 2877

source (16), an optical fiber (12), which acts as conduit for transmitting light from the source to the first orifice (22), a second orifice (24) coupled to an optical fiber (14), which acts as a conduit for transmitting light from the sample, and a detector (18) to detect the light brought to it via the optical conduit.

Watts fails to disclose that the light source is a light emitting diode. In column 1 lines 26-28, Alfano teaches, "It is generally known to use diode lasers or light emitting diodes (LED) as solid-state excitation sources for fluorescence", and continues in lines 29-31, "As early as 1988, a fluorometer from an LED and a photodiode detector was constructed." It would have been obvious to one of ordinary skill in the art at the time of invention to use a light emitting diode as the light source in the device of Watts in order to make the device smaller and lighter, as well as to use a more stable light source that requires less power.

Claims 23, 31, and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shea (US 3,665,201), previously cited, in view of McMullan et al (US 4,072,424).

In Figure 3, Shea discloses a turbidimeter (38), as specified by claim 31, having a housing (44) with a distal end with a shape adapted to insert into system of pipes, a light source (52), and a detector (64), thereby meeting all the limitations of the spectrometer specified in claim 23, on which claim 31 depends, and the limitation that the spectrometer be a turbidimeter, as specified in claim 31, except for the limitation in claim 23 that the light source be a light emitting diode.

Figure 3 of Shea additionally discloses an adjoining member (42) for connecting two pipes that allows material to flow and further comprises a chamber (48) that is open on one end and terminates on the flow passageway on the other end, where the spectrometer is inserted into

Art Unit: 2877

the chamber, as specified by claim 33. Shea does not disclose that the light source is a light emitting diode.

The spectrometer disclosed in Figure 3 has a housing (44) with a distal end with a shape adapted to insert into system of pipes, a light source (52), and a detector (64), as specified in claim 34, but does not have a light emitting diode as the light source, as specified by the claim.

In column 5 line 61, McMullan discloses that the light source for the turbidimeter of his invention is preferably a light emitting diode. It would have been obvious to one of ordinary skill in the art at the time of invention to use a light emitting diode as the light source in the device of Shea in order to make the device smaller and lighter, as well as to use a more stable light source that requires less power. The combination of McMullan and Shea therefore meets the limitations of claims 23, 31, 33 and 34.

Regarding claim 35, the spectrometer disclosed in Figure 3 of Shea is fastened to the adjoining member by flanges and bolts (column 2 lines 69-70), thereby meeting the limitation of having a fastening member for fastening the adjoining member and the spectrometer.

Claims 12-17 and 20-21 rejected under 35 U.S.C. 103(a) as being unpatentable over Byers in view of Alfano, in further view of Shea.

Regarding claims 12-15, the combination of Byers and Alfano discloses a fluorometer meeting all the limitations of claim 2, on which claim 12 depends, and claim 14 (housing with distal end (30), light source (22), and light detection circuit (36, 38, 40, 42) in Figure 2 of Byers, with a light emitting diode as a light source, as taught by Alfano), but does not disclose an adjoining member for connecting two pipes with all the limitations set forth in claims 12-13 and 15-17. Shea, in Figure 3, discloses an adjoining member (42) for connecting first and second

pipes (both labeled 40), having a passageway that allows non-solid material to flow between the pipes and across the distal end of the spectrometer (claim 12), the adjoining member further having a chamber (48) that is open on one end and terminates on the flow passageway on the other end, where a spectrometer is inserted into the chamber (claim 13). Additionally Shea discloses that the spectrometer is fastened to the adjoining member by flanges and bolts (column 2 lines 69-70), where the flanges and bolts comprise a fastening member (claim 15). It would have been obvious to one of ordinary skill in the art at the time of invention to use an adjoining member to securely fasten the fluorometer of Byers and Alfano into the system of pipes to facilitate insertion of the fluorometer into the system, to reduce costs by not requiring a long segment of special piping, to protect the fluorometer by securely fastening it to the pipe system, and to ensure consistency of readings by keeping the spectrometer fixed in one position.

Claims 20 and 21 speak to the method of using the apparatus specified in claims 13-15, with the stipulation that the fastening between the fluorometer and the adjoining member be a material-tight seal. The fastening devices disclosed by Shea (flanges and bolts) result in a material tight seal, even though Shea does not specify it as such. Claims 20 and 21 are therefore not patentably distinct from claims 13-15, and are rejected on the basis set forth above.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Byers, Alfano, and Shea, as applied to claim 20, in further view of Skoog.

Claim 22 depends on claim 20, which has been rejected above as unpatentable over the combination of Byers and Alfano, in view of Shea. Byers, Alfano and Shea disclose all the elements of claim 20, but do not disclose the method of calibration in which the fluorometer is placed sequentially in two standards of known concentration. Skoog teaches that quantitative

analytical methods are generally based on calibrating an instrument by collecting data on a series of standards of known concentration. It would have been obvious to one of ordinary skill in the art at the time of invention to calibrate the spectrometer using a standard method in order to compensate for drift in instrument response due to aging of the light source and detector, clouding of the light-transmitting window(s) over time, temperature changes, and electrical fluctuations.

Claims 9, 11, 28, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Byers and Alfano, in further view of Maczura (US 6,836,325). The combination of Byers and Alfano discloses all the elements in claims 8, 10, 27, and 29, on which claims 9, 11, 28, and 30 depend respectively, as set forth above, but does not disclose the light source positioned within a first orifice (claims 11 and 30) nor a detection circuit positioned in a second orifice (claims 9 and 28), where the end of each orifice toward the sample to be analyzed is covered with a seal that allows the light of interest to pass through. In Figure 1, Maczura discloses a spectrometer, which could be a fluorometer, with a light source (10) in an orifice (cavity; column 5 line 47) and a detection circuit (52) in a separate orifice (65), where each orifice has a window (12, 13), to prevent debris from entering the cavity (column 5 lines 22-23). Because the window prevents debris from entering the orifices, it acts as a seal; moreover because it is described as a window, it is inherently transparent to light in the wavelength range of interest. It would have been obvious to one of ordinary skill in the art at the time of invention to place the light source and detector in orifices at the distal end of the spectrometer to reduce the amount of light lost via transmission through an optical fiber (or conduit) thereby increasing the amount of light incident upon the sample and consequently transmitted to the detector in order to

increase the signal received by the detector.

Allowable Subject Matter

Claims 17, and 37-38 are allowed.

Claims 16 and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 16-17 and 36, the prior art of record taken alone or in combination fails to disclose a fluorometer or spectrometer for insertion into a system of pipes in which the threads for connecting the fluorometer and the adjoining member are present on the fluorometer and adjoining member, in combination with all the limitations of claims 16-17 and 36.

Regarding claims 37 and 38, the prior art of record taken alone or in combination fails to disclose a fluorometer adapted to fit into a system of pipes together with all the limitations of claims 37 and 38. Wheaton et al. (US 4,293,225) discloses a fluorometer in a tube shaped housing for measuring the fluorescence of material in solution with a light source, a detector, and a printed circuit board where the circuit board contains the circuitry of the fluorometer and the tube shaped housing contains substantially all of the fluorometer. The fluorometer of Wheaton is not shaped to insert into a system of pipes. Rasimas et al. (US 6,369,894) discloses a fluorometer with the specified components that is intended for insertion into a system of pipes, but the fluorometer is not in a tube shaped housing having a distal end.

Response to Arguments

Applicants' arguments with respect to claims 1, 13, 14, 18, 20, 23, 33, and 34, where a light emitting diode is specified as the light source, have been considered but are moot in view of the new ground(s) of rejection.

Applicants' arguments, see section IV on page 14, filed October 28, 2005, with respect to claim 17, and also applicable to claims 16 and 36, have been fully considered and are persuasive. The rejection of claims 16, 17 and 36 have been withdrawn. The combination of the references does not disclose or teach that the corresponding threads are on the actual fluorometer and adjoining member. The combination of references teaches a spectrometer and adjoining member held together by corresponding threads, and the corresponding threads are on nuts and bolts, rather than on the spectrometer and adjoining member.

Applicants argue the combination of references Byers and Shea, stating that the invention of Byers is a fluorometer and the invention of Shea is a turbidimeter, and they therefore are not combinable. Examiner respectfully submits that the inventions of Byers and Shea both measure light from a flowing sample and contain primarily the same components. Applicant considers both fluorometers and turbidimeters to be spectrometers and to be somewhat interchangeable, as evidenced by claims 31 and 32, which claim a turbidimeter and fluorometer, respectively, and which both depend from claim 23. Examiner therefore submits that it would be obvious to one of ordinary skill in the art to combine the inventions of Byers and Shea.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bartz (US 5,350,922), Kubisiak et al. (US 5,331,177), and Banerjee (US 6,307,630)

Art Unit: 2877

all disclose the use of a light emitting diode as the light source for a turbidimeter, thereby illustrating that the use of a light emitting diode as a light source for a turbidimeter is well known in the art.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah J. Chisdes whose telephone number is 571-272-8540. The examiner can normally be reached on 8:30am -5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Art Unit: 2877

Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S.J. Chisdes, Ph.D.
December 16, 2005